

CLAIMS

What is claimed is:

1. A method of detecting two or more target analytes in a sample, said method comprising:

5 i) providing a channel having affixed therein a binding partner for each of said two or more analytes, where the binding partners for each of said two or more analytes are located in different regions of said channel and said channel has a cross-sectional area small enough such that when analytes are released from said two or more binding partners into a fluid flowing through said channel, said analytes remain spatially segregated until they reach a detection point in said channel downstream from said binding partners;

10 ii) passing a fluid comprising said sample through said channel under conditions where said target analytes present in said sample bind to their respective binding partners thereby spatially encoding said analytes in said channel;

15 iii) releasing said analytes from said binding partners into said fluid passing along said channel; and

iv) detecting said analytes at a position in said channel downstream from said binding partners.

2. The method of claim 1, wherein said analytes are not labeled.

3. The method of claim 1, wherein said channel is a capillary tube.

20 4. The method of claim 3, wherein said capillary tube is a capillary electrophoresis tube.

5. The method of claim 1, wherein said channel is a channel etched in a surface.

25 6. The method of claim 5, wherein said channel is a channel etched in a glass surface.

7. The method of claim 1, wherein said channel is a channel in a ceramic.

8. The method of claim 1, wherein said channel is a channel in a plastic.

9. The method of claim 1, wherein said channel has a cross-sectional area that provides a Reynold's number (Re) of less than about 1.

5 10. The method of claim 1, wherein said channel has a cross-sectional diameter less than about 100 μm .

11. The method of claim 1, wherein said channel has a cross-sectional width less than about 500 μm .

10 12. The method of claim 1, wherein said channel has a cross-sectional width less than about 100 μm .

13. The method of claim 1, wherein said two or more target analytes comprise at least three different analytes.

14. The method of claim 1, wherein said binding partners are selected from the group consisting of antibodies, binding proteins, and nucleic acids.

15 15. The method of claim 14, wherein said binding partners are nucleic acids.

16. The method of claim 1, wherein said passing a fluid comprises fluid flow induced by a pressure difference.

20 17. The method of claim 1, wherein said passing a fluid comprises electroosmotic fluid flow.

18. The method of claim 1, wherein said sample comprises a fluid selected from the group consisting of blood, plasma, serum, urine, oral fluid, cerebrospinal fluid, and lymph.

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19. The method of claim 1, wherein said detecting comprises absorbance spectroscopy.
20. The method of claim 1, wherein said detecting comprises sinusoidal voltammetry.
- 5 21. The method of claim 1, wherein said analytes are nucleic acids and said detecting detects target analytes at a concentration of less than 1×10^{-9} M.

Patent Office